

An Automatic Notification System for Test Results Finalized After Discharge

Principal Investigator:	Dalal, Anuj K., M.D.
Organization:	Brigham and Women's Hospital
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Summary: The transition to the ambulatory setting following hospital discharge is a vulnerable time for patients. One important patient safety concern is failure of responsible providers to followup on test results finalized after a patient is discharged. Such failure can lead to delays in diagnosis, missed treatment opportunities, redundant test orders, and subsequent patient harm. Automated systems that ensure timely notification of these test results to responsible providers have the potential to mitigate these well-documented problems and improve health care quality and safety. This project created an automated system to notify physicians of patients' test results pending at discharge (TPADs) via secure email. The system was designed to facilitate communication and acknowledgement of test results by responsible inpatient and ambulatory physicians during care transitions. The study team evaluated the system's impact on physicians' awareness of test results.

In the first phase of this study, components of the system were developed to: 1) identify tests with results pending at the time of discharge; 2) obtain the identity and email addresses of the responsible inpatient and ambulatory providers; 3) exclude routinely-ordered tests to avoid provider alert fatigue; and 4) automate notification to providers by email once results are available. The intervention relied primarily upon the inpatient clinical information system; the admission, discharge, and transfer systems; and network email to orchestrate the series of events that lead to the automated notification of final test results after discharge.

In the second phase, a cluster-randomized, 8-month controlled trial measured the impact of this system on physicians' awareness. The study participants were 441 patients who were discharged from the inpatient general medicine and cardiology services at Brigham and Women's Hospital (BWH). Prior to the intervention, staff randomized both the responsible inpatient provider (attending physician at time of hospital discharge) and the responsible outpatient provider (the patient's primary care physician [PCP]). The study population included patients with TPADs discharged from these services if both their inpatient attending physician and PCP were randomized to the either intervention or usual care. Patients were excluded if their inpatient attending physician and PCP were in discordant arms, or if their inpatient attending and PCP was the same person.

The primary outcome was awareness of any TPAD result by the inpatient attending physician. Secondary outcomes included awareness of any TPAD result by the PCP, user satisfaction, awareness of actionable test results, and whether appropriate actions are taken in response to these results after electronic health record review. Physician awareness was measured by a survey sent to responsible providers 72 hours after

the last finalized TPAD result was available. The study may inform future efforts to optimize this type of intervention at BWH and other institutions trying to minimize this patient safety problem.

Specific Aims:

- Create an automatic notification system to prompt physicians of test results finalized after discharge. **(Achieved)**
- Evaluate the impact of this system on physician awareness of test results finalized after discharge. **(Achieved)**

2012 Activities: During this period the study team used a no-cost extension to complete the final analysis and develop manuscripts. As last self-reported in the AHRQ Research Reporting System, project progress was completely on track and project spending was on target. The project ended in March 2012.

Impact and Findings: Four-hundred and forty-one patients assigned to either arm by randomized physician pair were analyzed. Surveys were sent to 441 attendings and 353 PCPs, and 275 and 152 responses were received from 80 attendings and 113 PCPs, respectively. Intervention attendings and PCPs were significantly more aware of TPAD results, while intervention attendings were more aware of actionable TPAD results. One-hundred and eighteen (85 percent) and 43 (63 percent) intervention attending and PCP survey respondents, respectively, were satisfied with this strategy. The project team concluded that automated email notification is a promising strategy to manage TPADs, potentially mitigating an unresolved patient safety concern. Future areas of research should include down-stream actions taken on TPAD results post-discharge, impact on readmissions, the relative effect on network versus non-network PCPs, and post-discharge health service utilization.

Target Population: General

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to support patient-centered care, the coordination of care across transitions in care settings, and the use of electronic exchange of health information to improve quality of care.

Business Goal: Knowledge Creation
